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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the satellite broadcasting service receiving system which receives the electric wave from satellite broadcasting service, and reproduces a video signal and a sound signal.

[0002]

[Description of the Prior Art] It becomes reception of satellite broadcasting service, and reproducible by adding a satellite broadcasting service receiving system equipped with BS antenna which receives the electric wave from a broadcasting satellite to the usual television receiver which receives the electric wave (ground wave) from a terrestrial broadcasting station, and reproduces a video signal and a sound signal, the outdoor arrangement installed in a RF side, and the indoor arrangement installed in a low frequency side.

[0003] Drawing 3 is the system configuration Fig. showing an example of the conventional satellite broadcasting service receiving system. In this drawing, the antenna for satellite broadcasting service reception (BS) with which 100 is installed in the outdoors, the outdoor arrangement (ODU) with which 200 is installed in the latter part of an antenna 100, and 300 are indoor arrangements (IDU) of an outdoor arrangement 200 further installed in the latter part.

[0004] The high-frequency amplifier 201 which amplifies the RF which the outdoor arrangement 200 was called the low noise block converter (LNB), and was received with the antenna 100, for example, the satellite broadcasting electric-wave of a 12GHz band, (RFAMP), The band-pass filter 202 which removes a noise component from the output of this amplifier 201 (BPF), The output of this filter 202 For example, the 1st frequency mixer 203 changed into the 1st intermediate frequency signal of a frequency the band of 1GHz (MIX), This mixer 203 is equipped with the fixed frequency oscillator (OSC) 204 which supplies a predetermined local oscillation signal, and the intermediate frequency amplifier (IFAMP) 205 of the output stage which amplifies the output of a mixer 203.

[0005] An indoor arrangement 300 The intermediate frequency amplifier 301 of an input stage (IFAMP), The 2nd frequency mixer 302 which carries out frequency conversion of the output of this amplifier to the 2nd intermediate frequency signal of a still lower frequency, for example, a 400MHz band, (MIX), The variable frequency oscillator 303 which supplies a local oscillation signal to this 2nd mixer 302 (OSC), The intermediate frequency amplifier 304 which amplifies the output of a mixer 302 (IFAMP), The band-pass filter 305 which removes a noise component from the output of this amplifier 304 (BPF), It has the demodulator circuit (DEMOD) 306 which restores to the output of this filter 305,

and the decoder (DEC) 307 which decodes the digital output of this demodulator circuit 306, and reproduces the video signal and sound signal of an analog, and the output of this decoder circuit is reproduced on a display 311.

[0006] An indoor arrangement 300 equips further the phase-locked loop (PLL) 308 which determines the oscillation frequency of a variable frequency oscillator 303, CPU309 which gives an error signal to this phase-locked loop 308, and this CPU309 with the channel selection key 310 which gives the channel selection information which becomes the radical of said error signal, and the block except a display 311 is set-sized as a broadcasting satellite tuner.

[0007]

[Problem(s) to be Solved by the Invention] There are the following troubles in the system of drawing 3.

(1) The signal transmitted to an indoor arrangement 300 from an outdoor arrangement 200 becomes cost quantity in order that it is necessary to use a coaxial cable with little loss for the indoor transmission medium 400 for drawing in since it is a high frequency band (1GHz band), and the die length may generally amount to about 20m. (2) Since the frequency changing circuit containing a frequency mixer and a local frequency oscillator is required for both an outdoor arrangement 200 and the indoor arrangement 300, circuitry is complicated, and there are many components mark and they become expensive.

[0008] the configuration which this invention can omit the frequency changing circuit by the side of an indoor arrangement, and can use a cheap multi-conductor cable for the signal transmission by the side of an indoor arrangement -- it aims at simplifying and offering a cheap satellite broadcasting service receiving system.

[0009]

[Means for Solving the Problem] The antenna with which the above-mentioned purpose of this invention receives the electric wave from a broadcasting satellite, and the outdoor arrangement installed in a RF side, It is a satellite broadcasting service receiving system equipped with the indoor arrangement installed in a low frequency side. Said outdoor arrangement The frequency changing circuit which changes into an intermediate frequency signal said electric wave received with said antenna, It has the demodulator circuit which restores to the output of this frequency changing circuit to the digital signal of low frequency. Said indoor arrangement The decoder which decodes the digital signal from said demodulator circuit to the video signal and sound signal of an analog, The 1st multi-conductor cable which has CPU which the local oscillation frequency of said frequency changing circuit is changed, and tunes it in, and transmits said digital signal to said indoor arrangement from said outdoor arrangement further, A satellite broadcasting service receiving system equipped with the 2nd multi-conductor cable which connects between said CPUs and said frequency changing circuits can attain.

[0010] According to 1 operation gestalt of this invention, said frequency changing circuit is equipped with the frequency mixer which considers said electric wave as one input, the variable frequency oscillator which generates the RF signal of the local oscillation frequency used as the input of another side of this mixer, and the phase-locked loop which sets up the oscillation frequency of this oscillator, and said CPU inputs the error signal according to channel selection information into said phase-locked loop.

[0011] The antenna with which the above-mentioned purpose of this invention receives the electric wave from a broadcasting satellite again, It is a satellite broadcasting service receiving system equipped with the outdoor arrangement installed in a RF side, and the indoor arrangement installed in a low frequency side. Said outdoor arrangement The frequency changing circuit which changes into an intermediate

frequency signal said electric wave received with said antenna, The demodulator circuit which restores to the output of this frequency changing circuit to the digital signal of low frequency, It has the 1st CPU which the local oscillation frequency of said frequency changing circuit is changed, and tunes it in. Said indoor arrangement The decoder which decodes the digital signal from said demodulator circuit to the video signal and sound signal of an analog, It has the 2nd CPU which communicates with said 1st CPU and transmits channel selection information. Furthermore, a satellite broadcasting service receiving system equipped with the multi-conductor cable which transmits said digital signal to said indoor arrangement from said outdoor arrangement, and is used for communication between said 1st CPU and said 2nd CPU can attain.

[0012] According to 1 operation gestalt of this invention, said frequency changing circuit The frequency mixer which considers said electric wave as one input, and the variable frequency oscillator which generates the RF signal of the local oscillation frequency used as the input of another side of this mixer, It has the phase-locked loop which sets up the oscillation frequency of this oscillator, said 1st CPU inputs an error signal into said phase-locked loop, and said 2nd CPU supplies the channel selection information set to said 1st CPU on the radical of said error signal.

[0013] The outdoor arrangement of this invention changes into an intermediate frequency signal the satellite broadcasting electric-wave of the high frequency received with the satellite broadcasting service receiving dish, and restores to it even to the digital signal of low frequency further. For this reason, an indoor arrangement does not need a frequency changing circuit that what is necessary is just to have low frequency processing circuits, such as a circuit which decodes said digital signal to the video signal and sound signal of an analog. Therefore, a system-wide configuration is simplified.

[0014] The outdoor arrangement of this invention outputs the digital signal of low frequency. Therefore, a cheap multi-conductor cable is enough as the cable which transmits this digital signal to an indoor arrangement, and it can reduce system-wide cost.

[0015]

[Embodiment of the Invention] Hereafter, this invention is explained to a detail with reference to the operation gestalt shown in the drawing. Drawing 1 is the block diagram of the satellite broadcasting service receiving system in which 1 operation gestalt of this invention is shown. In this drawing, BS antenna with which 100 receives the electric wave from a broadcasting satellite, the outdoor arrangement (ODU) with which 200 is installed in a RF side, the indoor arrangement (IDU) with which 300 is installed in a low frequency side, and 401 and 402 are the 1st and 2nd multi-conductor cables which connect between an outdoor arrangement 200 and indoor arrangements 300.

[0016] An outdoor arrangement 200 has the high-frequency amplifier 201 which amplifies said electric wave received with the antenna 100, the band-pass filter 202 which removes a noise component from the output of this amplifier 201, the frequency changing circuit 210 which changes the output of this filter 202 into an intermediate frequency signal, the intermediate frequency amplifier 205 which amplifies the output of this frequency changing circuit 210, the band-pass filter 211 which removes a noise component from the output of this amplifier 205, and the demodulator circuit 212 which restores to the output of this filter 211 to the digital signal of low frequency.

[0017] A frequency changing circuit 210 is equipped with the frequency mixer 203 which considers said electric wave as one input, the variable frequency oscillator 213 which generates the RF signal of the local oscillation frequency used as the input of another side of this mixer 203, and the phase-locked loop 214 which sets up the oscillation frequency of this oscillator 213. To this phase-locked loop 214, the error signal according to channel selection information is inputted from CPU by the side of an indoor

arrangement 300.

[0018]

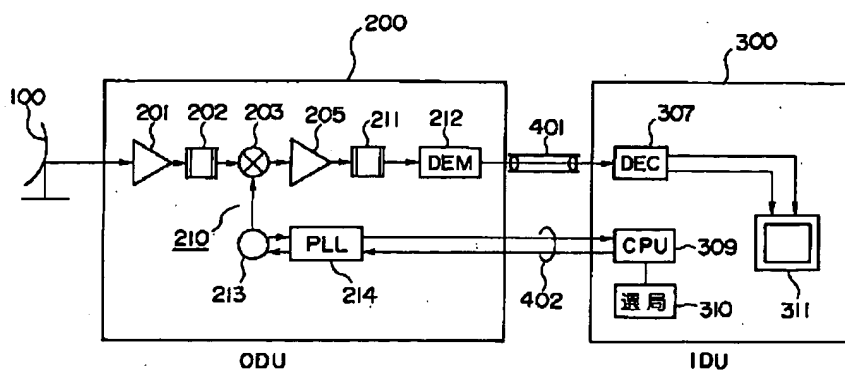
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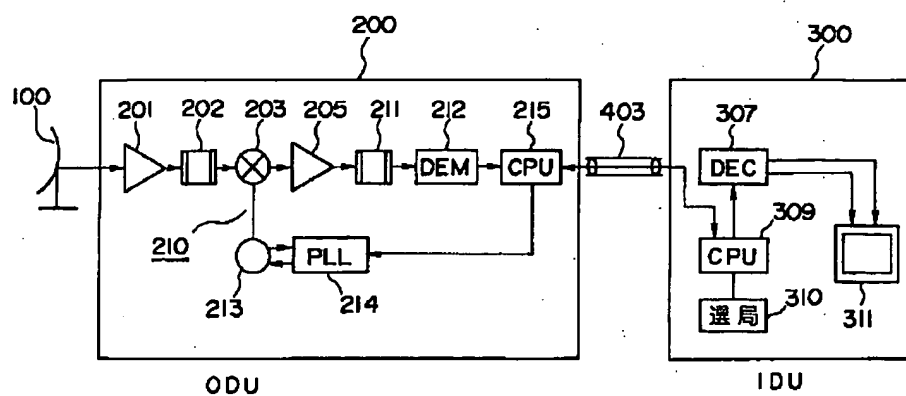
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INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

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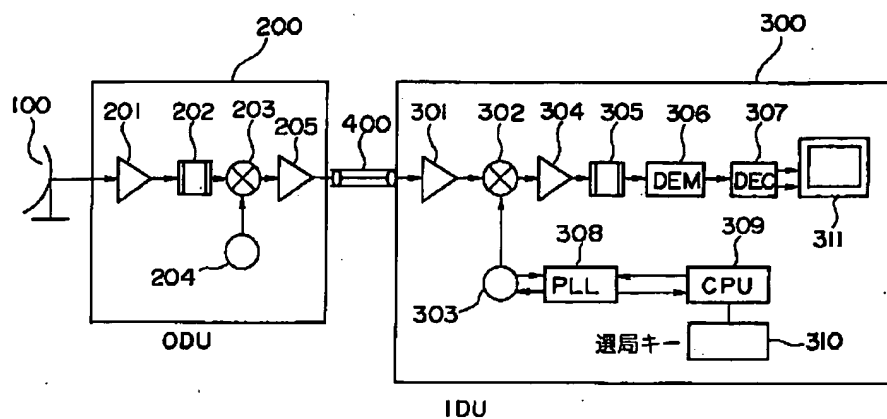
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